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AUTHOR Carlton, Linda L.
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ABSTRACT

Energy activities are provided in this student activity book. They include: (1) an energy walk; (2) forms of energy in the home; (3) energy conversion; (4) constructing a solar hot dog cooker (with instructions for drawing a parabola); (5) interviewing senior citizens to learn about energy use in the past; (6) packaging materials; (7) insulation; (8) energy conservation in the home; (9) traffic count; and (10) a role-playing activity comparing the lifestyles of two families. Concepts/topics covered in the activities include: (1) work (movement, change); forms of energy (mechanical, radiant, chemical, electrical, nuclear, thermal, sound) and energy conversion; (3) renewable and non-renewable energy resources; (4) development of energy resources (origin, equipment, uses, environmental impact, economic impact); (5) society and energy, focusing on energy use (energy use eras and present patterns), power and politics (international, national, and local), and the future of energy; (6) practical energy applications in manufacturing, heating/cooling, and transportation; and (7) making energy decisions. (Author/JN)

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ENERGY ADVENTURE CENTER

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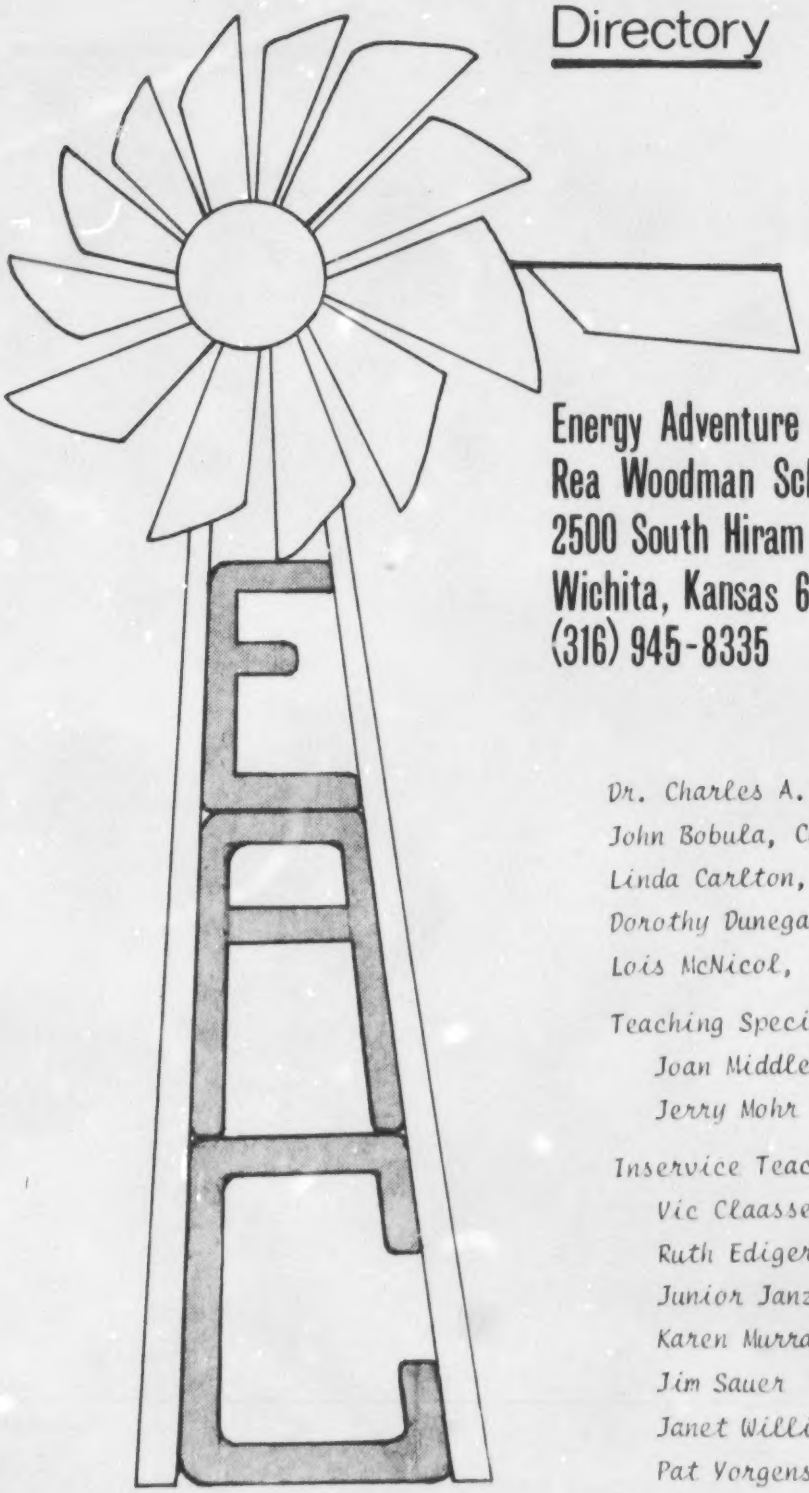
ACTIVITY BOOK

WICHITA PUBLIC SCHOOLS
UNIFIED SCHOOL DISTRICT 259
Dr. Alvin E. Morris, Superintendent

Dr. Lawrence A. Bechtold, Director
Curriculum Services Division

Linda L. Carlton, Coordinator
Energy Adventure Center

SE039401



Directory

Energy Adventure Center
Rea Woodman School
2500 South Hiram
Wichita, Kansas 67217
(316) 945-8335

Dr. Charles A. Thompson, Co-Director
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OUTLINE OF EAC PROGRAM OBJECTIVES

I. **Work**
   - A. Movement
   - B Change

II. **Forms of ENERGY**
   - A. Recognize
     1. Mechanical (movement)
     2. Radiant (light)
     3. Chemical (burning)
     4. Electrical
     5. Nuclear
     6. Thermal (heat)
     7. Sound
   - B. Forms can be converted

III. **Resources and ENERGY**
   - A. Types of resources
     1. Non-renewable
     2. Renewable
   - B. Development of resources
     1. Origin
     2. Equipment
     3. Uses
     4. Environmental impact
     5. Economic impact

IV. **Society and ENERGY**
   - A. Energy use
     1. Energy use eras
     2. Present patterns
   - B. Power and politics
     1. International
     2. National
     3. Local
   - C. Energy future
     1. Hard
     2. Soft

V. **Individual and ENERGY**
   - A. Practical applications
     1. Manufacturing
     2. Heating/Cooling
     3. Transportation
   - B. Energy decisions
     1. Obtain facts, information, data
     2. Explore options
     3. Evaluate
     4. Plan action

Energy Walk

Instructions:

Energy is all around us -- all we have to do is become aware of it. Energy is the ability to do work. We know energy is at work if something moves or changes. Take a walk to find energy. Students may walk along noting movement and/or changes in matter. Have them write down some examples. Afterwards they could share their findings with the whole group.

Notes:

Which of the following questions could be answered with this activity?

1. What is energy doing?

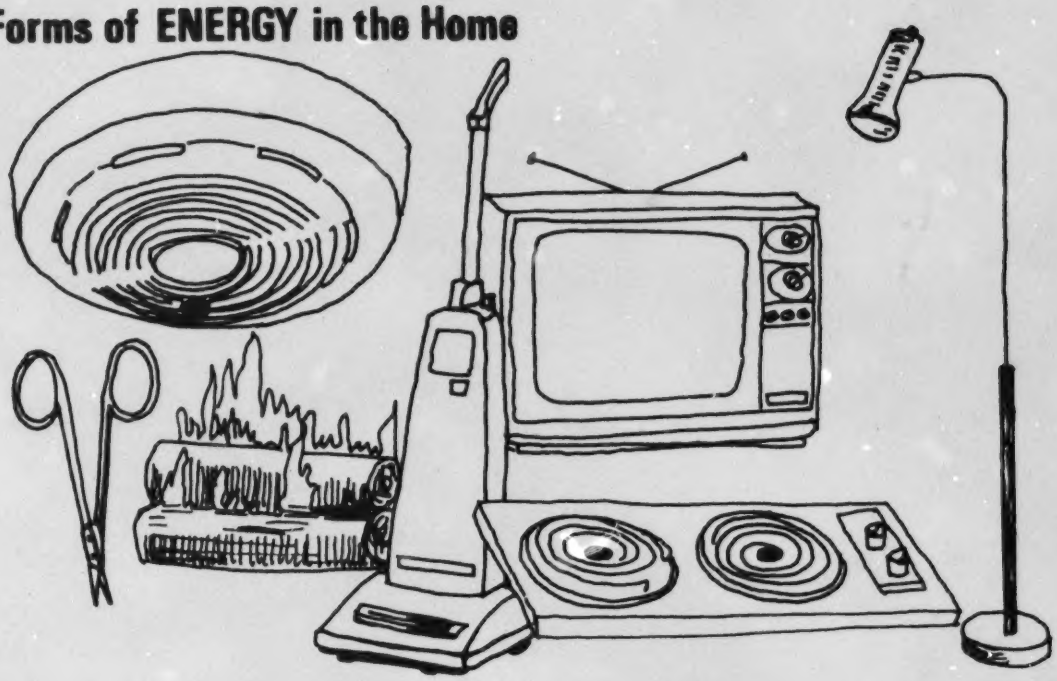
2. What forms are being converted?

3. What resources are being used?

4. What changes could this activity mean for society?

5. How could this activity change the individual's use of energy?

Forms of ENERGY in the Home



Instructions:

There are seven forms of energy: mechanical, radiant, chemical, electrical, nuclear, thermal, and sound. Students find things in their homes that they can associate with these forms of energy. The word "associate" is used here as a general term. There will be certain things that can be classified as more than one form. For instance, a television might be an example of electrical, radiant, or sound energy.

Notes:

Which of the following questions could be answered with this activity?

1. What is energy doing?

2. What forms are being converted?

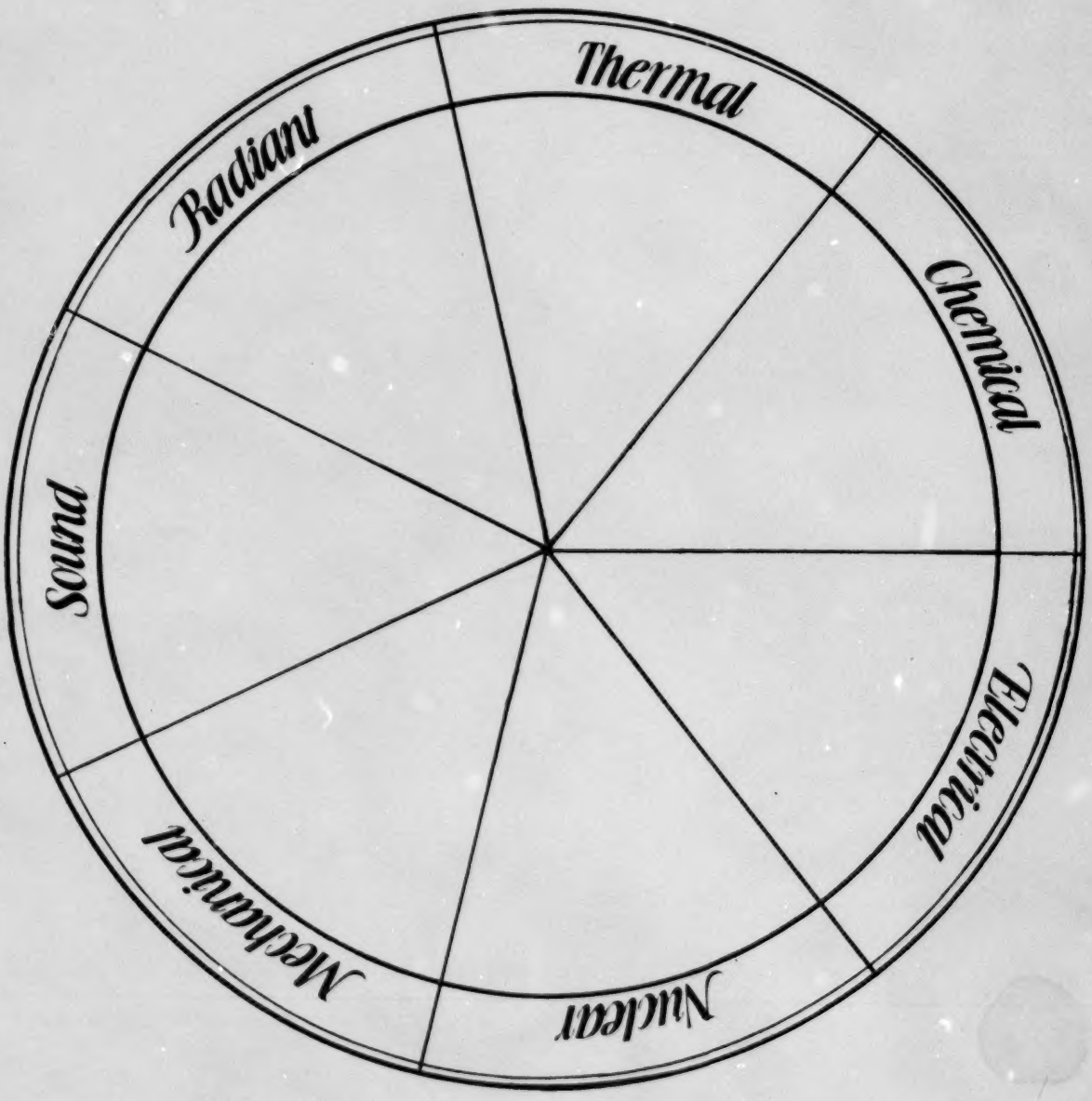
3. What resources are being used?

4. What changes could this activity mean for society?

5. How could this activity change the individual's use of energy?

Forms of ENERGY in the Home

Find things in your home that you would associate with these forms of energy.



Energy Converters Drill Sheets

Instructions:

Energy conversion means changing one form of energy to another form of energy. Work with the students on this activity by having them fill in the blanks. Each item will convert one form of energy into other forms of energy.

Notes:

Which of the following questions could be answered with this activity?

1. What is energy doing?

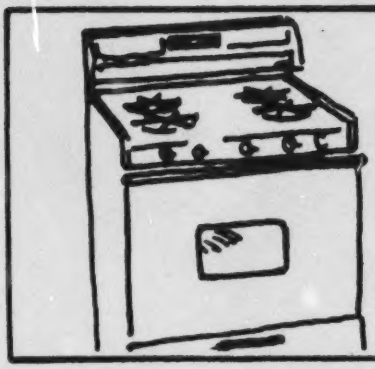
2. What forms are being converted?

3. What resources are being used?

4. What changes could this activity mean for society?

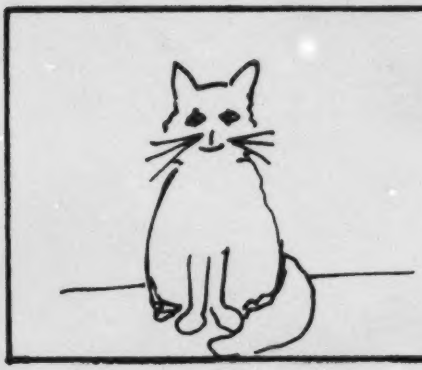
5. How could this activity change the individual's use of energy?

ENERGY *Converters* **Name** _____



converts

_____ to _____



converts

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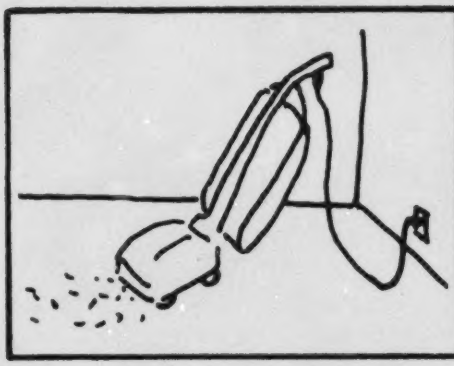

converts

_____ to _____

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page 1

ENERGY *Converters*

Name _____

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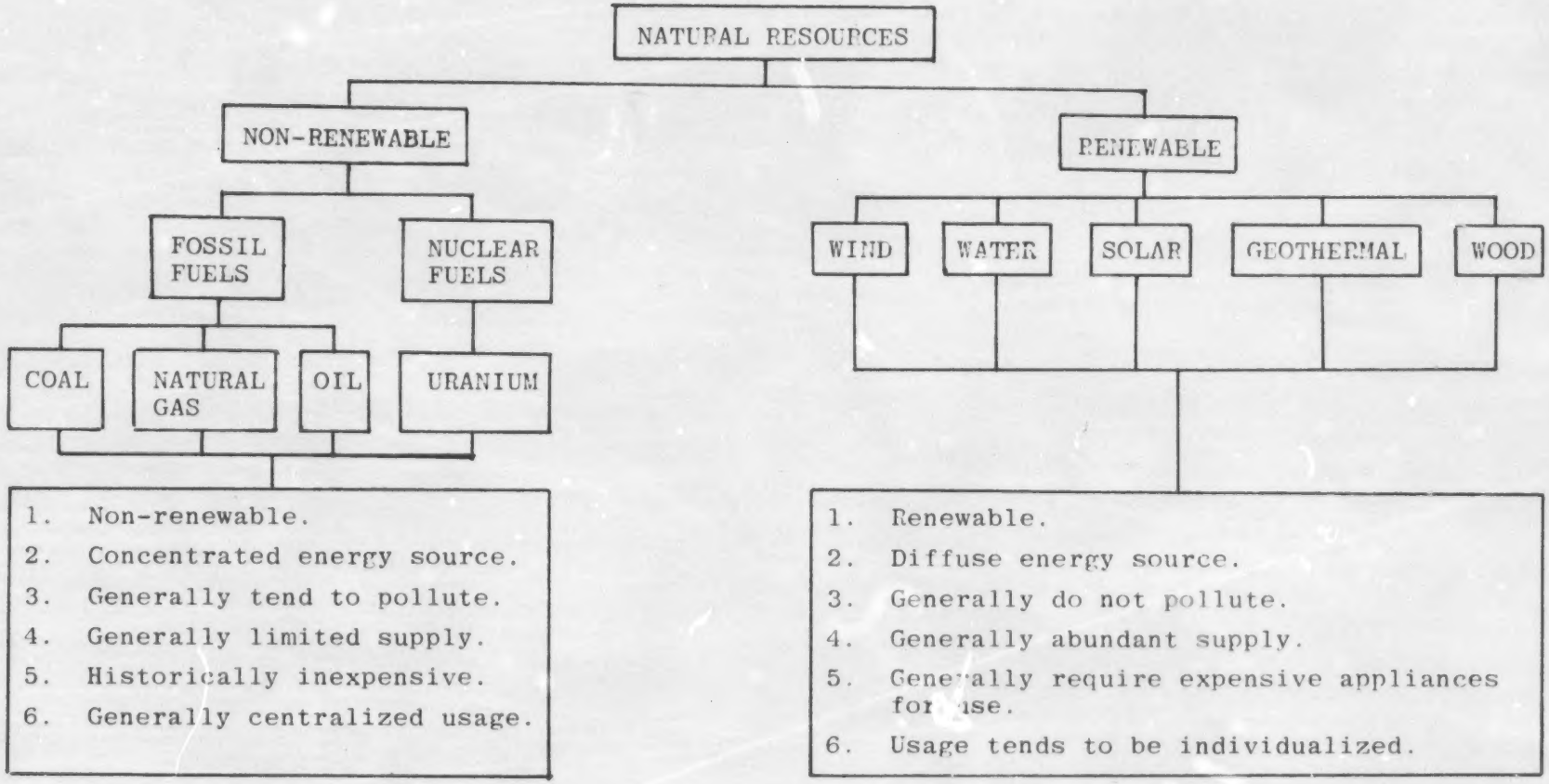
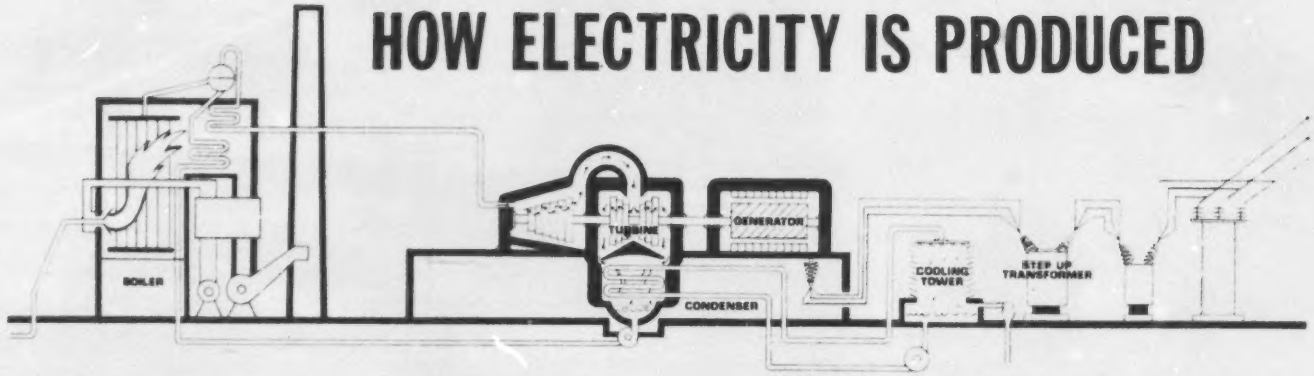
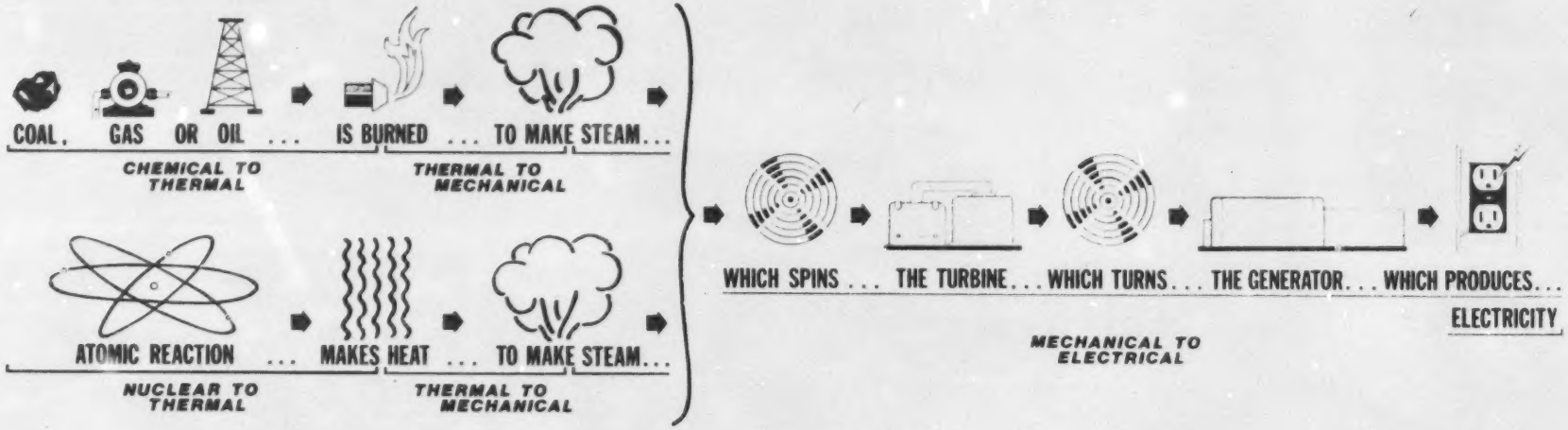
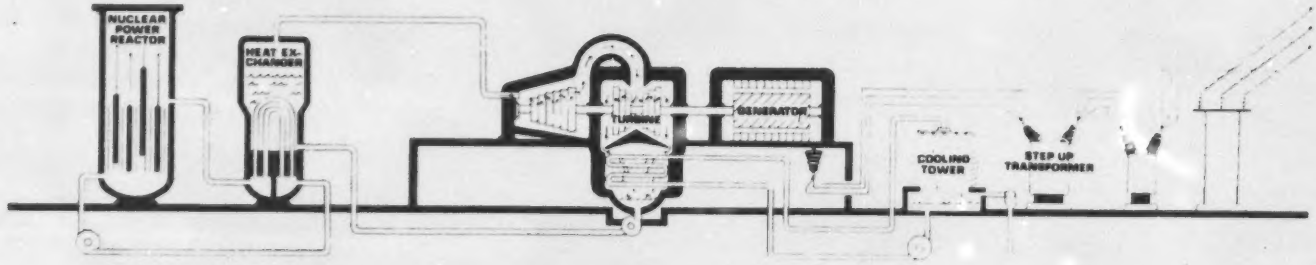

NATURAL RESOURCES
NON-RENEWABLE
RENEWABLE
FOSSIL FUELS
NUCLEAR FUELS
WIND
WATER
SOLAR
GEOTHERMAL
WOOD
COAL
NATURAL GAS
OIL
URANIUM
1. Non-renewable.
2. Concentrated energy source.
3. Generally tend to pollute.
4. Generally limited supply.
5. Historically inexpensive.
6. Generally centralized usage.
1. Renewable.
2. Diffuse energy source.
3. Generally do not pollute.
4. Generally abundant supply.
5. Generally require expensive appliances for use.
6. Usage tends to be individualized.

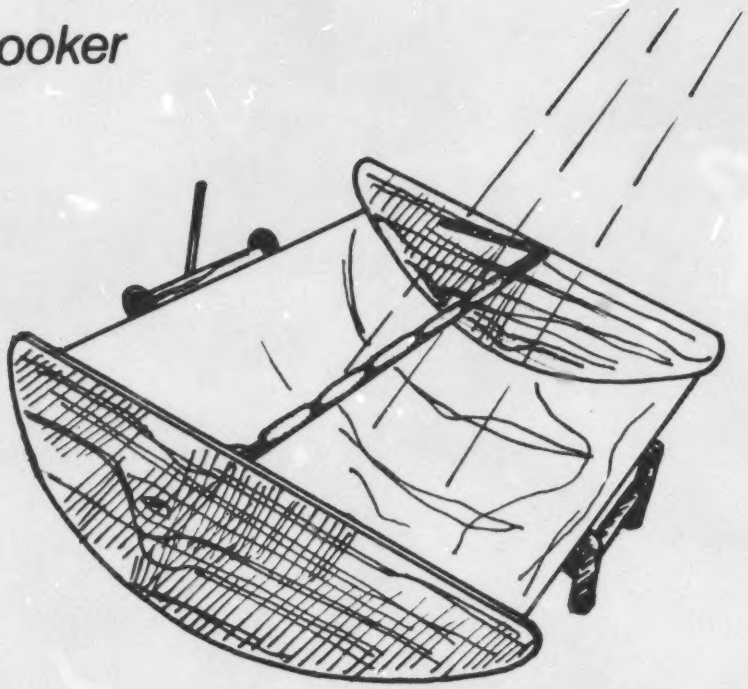
HOW ELECTRICITY IS PRODUCED




COAL, GAS OR OIL ... IS BURNED ... TO MAKE STEAM...
CHEMICAL TO THERMAL
THERMAL TO MECHANICAL
ATOMIC REACTION ... MAKES HEAT ... TO MAKE STEAM...
NUCLEAR TO THERMAL
THERMAL TO MECHANICAL
WHICH SPINS ... THE TURBINE ... WHICH TURNS ... THE GENERATOR ... WHICH PRODUCES...
ELECTRICITY
MECHANICAL TO ELECTRICAL



Solar Cooker



Instructions:

The solar cooker is operated by aiming the entire unit toward the sun and focusing the sun's rays on the tray (i.e., the focal point). In order to do this, center the target shadow on the arrow at the bottom of the parabola. When the tray becomes hot cooking can be started.

Notes:

Which of the following questions could be answered with this activity?

1. What is energy doing?

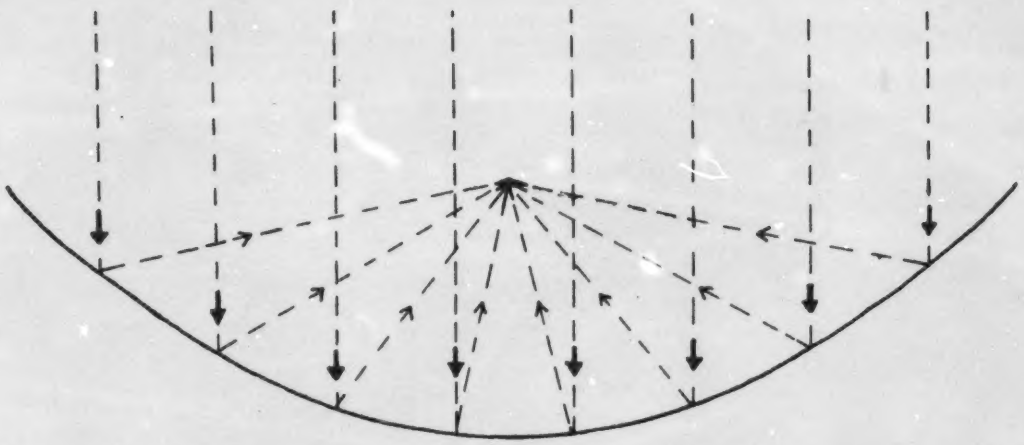
2. What forms are being converted?

3. What resources are being used?

4. What changes could this activity mean for society?

5. How could this activity change the individual's use of energy?

How to Draw a Parabola



Instructions:

Use these instructions to make a parabola--a curved surface that focuses radiant energy on a certain area.

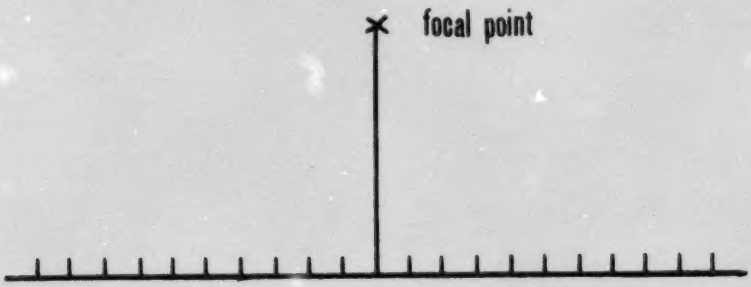
1. Make a base line.

2. Mark it at 5mm intervals.

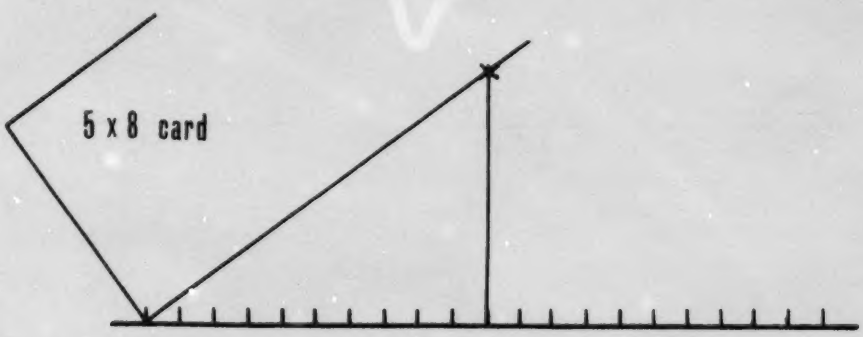
3. Find the center of the base line and draw a line perpendicular to it.

How to Draw a Parabola

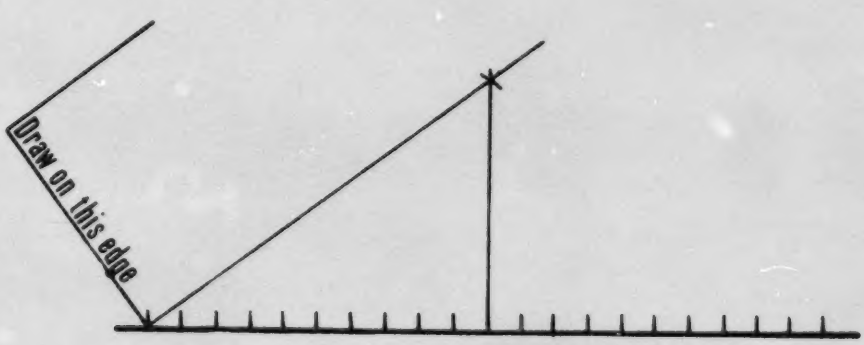
4. Make a focal point on this perpendicular line about 4 cm from the base.



5. Take something that has a right angle, like a 5 x 8 index card, and place a corner of it on one of the 5mm marks on the base line and align the edge on the focal point.

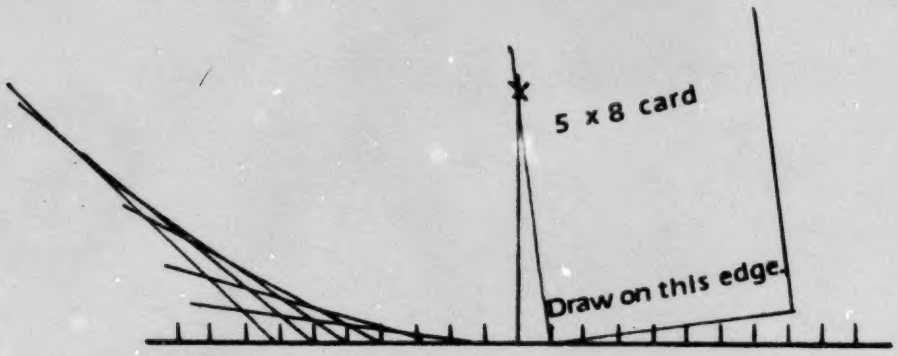


6. Draw a line along the base of the index card.

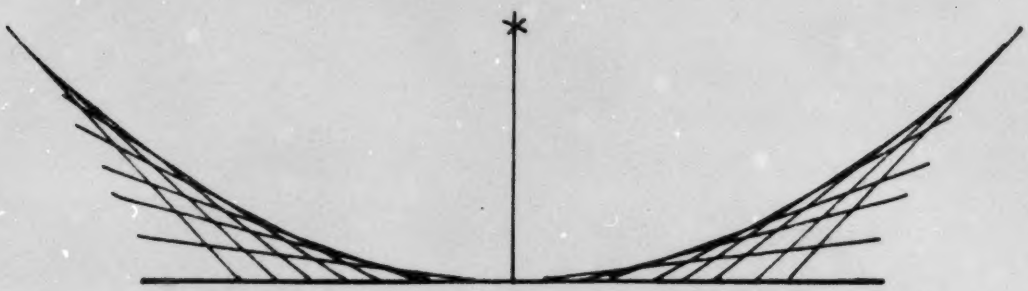


How to Draw a Parabola

7. Repeat for every point along the base line.



8 When you finish, you will have a parabola.



9. Try making another parabola. Move the focal point up or down and see what happens to the shape of the parabola.

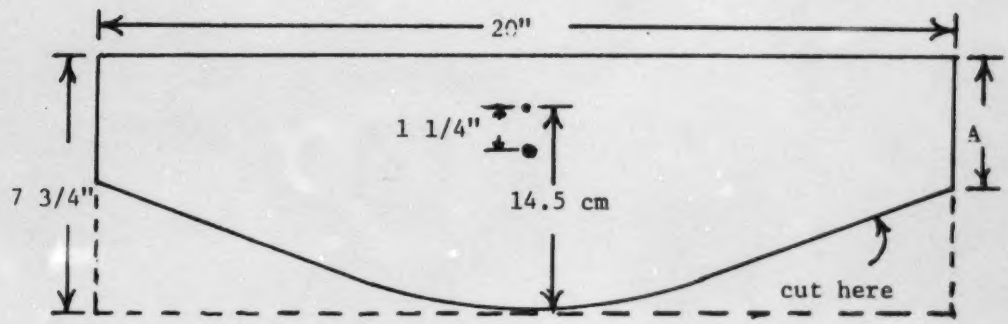
Notes:

Solar Hot Dog Cooker

Instructions:

I. The Frame

1. Cut a 20" x 7 3/4" rectangle out of 1/2" plywood or other suitable material.
2. Using one of the 20" sides as a base line, draw a parabola with a 14.5 cm. focal point.*
3. Drill a 1/8" hole at the focal point.
4. Drill a 1/4" hole 1 1/4" directly below the focal point.
5. Cut along the parabola line to make an end piece. Use this end as a template to make another.



6. Cut two stripes of 1/2" plywood (or whatever is being used) to desired length and the same width as dimension "A" in the diagram. This will be approximately 3 1/4".

*See EAC activity How to Draw a Parabola.

II. The Tray

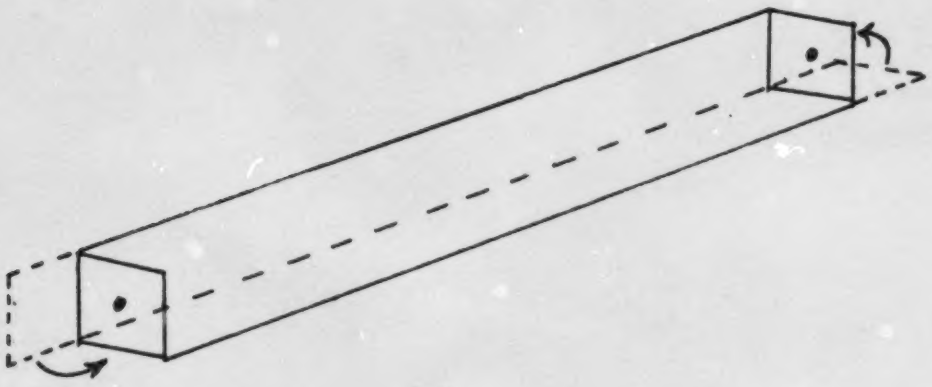
1. Cut a strip of aluminum flashing 2" wide and long enough to fit snugly between the end pieces plus 2".

2. Notch the strip as shown in the illustration.

3. Drill 1/8" holes in the center of each and tab.

4. Score the aluminum strip as indicated by the dotted lines.

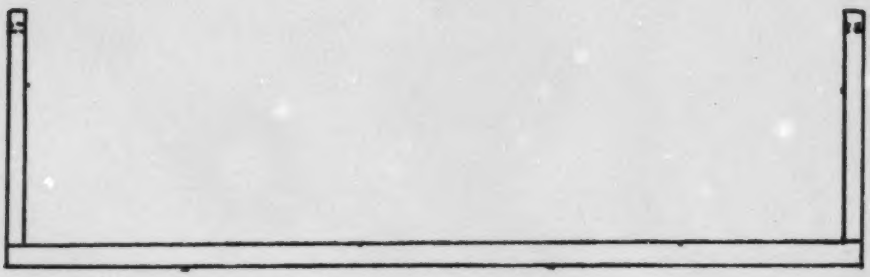
5. Fold the end tabs up and the tray into a "V" shape as shown.



Solar Hot Dog Cooker

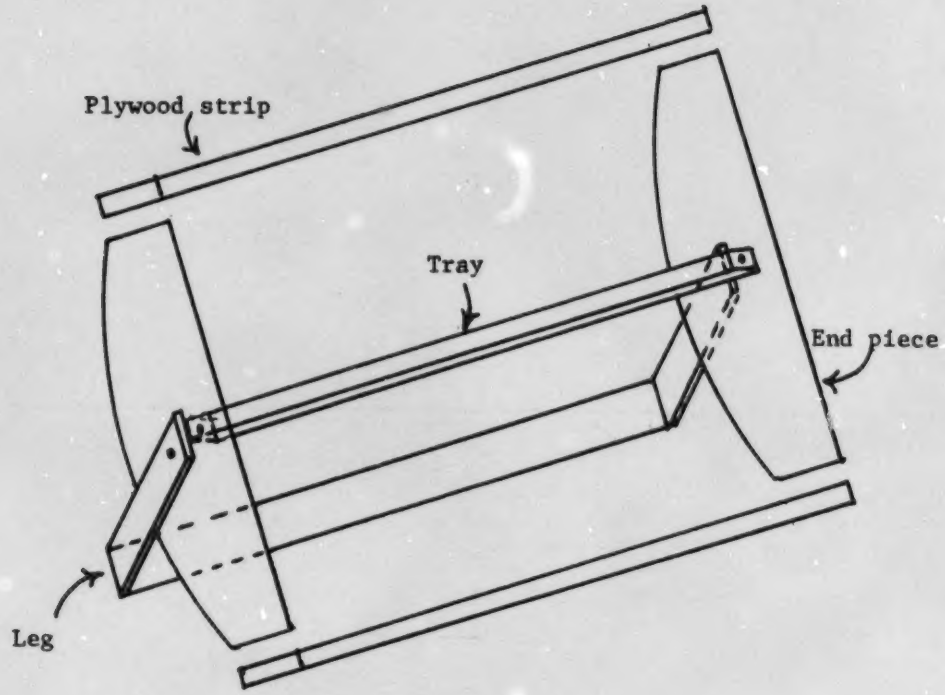
III. The adjustment leg.

1. Cut two pieces of 1" x 2" 11 1/2" long.
2. Drill a 1/4" hole 1/2" from the end of each piece.
3. Cut another piece of 1" x 2" 1 1/2" longer than the plywood frame strips which were cut earlier.
4. Nail or screw the long 1" x 2" to the two shorter pieces at the ends opposite the holes.

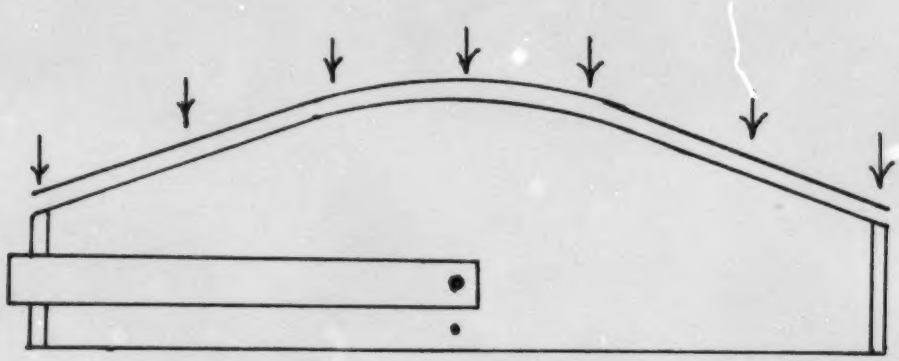


IV. Assembly

1. Nail or screw the plywood strips to the end pieces.
2. Attach the tray to the end pieces with 6 - 32 machine bolts.
3. Attach the adjustment leg to the end pieces with 1/4" machine bolts.



4. Place hot dog cooker face down on a smooth surface. Attach reflective surface with staples, tacks, or small nails.



Oral History Interviews

Instructions:

The students can conduct oral history interviews of senior citizens to learn about energy use in the past. Use the booklet "An Oral History Primer", available from the Energy Adventure Center, to orient the students to oral history procedures. Have them prepare a guidesheet/checklist of their own or use one or more of the attached forms on their visit with senior citizens.

Arrangements for the visit should be made two weeks in advance. In Wichita, teachers may call the RSVP (Retired Senior Volunteer Program) office. You will need to supply the following information:

Teacher's name	School
Telephone number	Address
Grade level	Room number
Number of students	

Date and time senior citizens are wanted

Number of senior citizens desired

Topic the senior citizens will discuss

Oral History Interviews

You will be asked to provide parent volunteers to drive the senior citizens to and from the presentation. You are also encouraged to involve more than one class of students in the presentation. It may be that the senior citizens may speak to only one class at a time, but to utilize their services more extensively, it is recommended that they meet with more than one class at each school.

If tape recorders are available, you may want to tape the conversation with the senior citizens. Permission to tape interviews should be obtained first from the senior citizens. You may also want to take pictures during the interviews. These may be helpful in the use and presentation of the material gathered from the visitation.

Contact: Jackie Lugrand
Retired Senior Volunteer Program
RSVP
212 N. Market
Wichita, KS 67202
(316)-263-1252

Oral History Interviews

The following categories and related questions might give you some ideas for topics to discuss with senior citizens. They should be considered as a springboard to further questioning. No doubt you and your students will think of many questions you'd like to ask that are not suggested here.

Clothing:

1. How did the weather, the seasons, or certain special occasions influence the type of clothing you wore? Did you dress to keep warm or cool, or did you dress just to be in style? What type of clothing was in style when you were young?
2. Were most of your clothes sewn at home or were they bought from a store? If your clothes were sewn at home, what tools were used to make them? If your clothes were bought from a store, were there many styles from which you could choose?
3. What materials were used in clothing? How were clothes kept clean? What kind of a washing machine did you have? How did you heat the water? What were soaps like? Could they be bought in the store or were they made at home? If made at home, how were they made? How were clothes dried?

Communication:

1. How did you keep in touch with other people when you were growing up?
2. Describe the kind of radio you had when you were a child.
3. Describe the type of television you had when you were a school age child.
4. Was your mail delivered to your home? Where was your mailbox? How often was mail delivered?

Food:

1. What kinds of utensils did you have in your home to help you prepare food?
2. How did you keep food from spoiling?
3. What kind of stove and what kind of fuel did your family use for cooking?
4. How was water obtained for washing dishes and preparing food?
5. What kinds of groceries were available in the grocery store (general store)?
6. Plastics are used so much in packaging today. What materials were used to package food when you were a child?
7. Explain the types of food processing that were done when you were a child, i.e.--canning, dehydrating, curing, etc.

Land:

1. Land can be used for many things--pastures, fields, parks, housing areas, parking lots, industrial parks, shopping centers, etc. How was the land used when you were growing up?
2. What kinds of industries (factories) were already in operation which might have misused or abused the land or polluted the streams when you were a child?

Leisure (Use of Time):

1. What kinds of entertainment did you enjoy?
2. What forms of recreation did you have available to you when you were young?
3. How much energy was used in these recreation activities?
4. Describe what you considered to be leisure time when you were a child.
5. What types of activities did you do during your leisure time as a child?
6. Describe what you considered to be a vacation.

Oral History Interviews

Money:

1. Describe the types of jobs for which you were responsible and the allowance, if any, you received for doing them?
2. On what types of activities did you spend your money or did you save it?
3. If you spent money on activities, what kind of energy did these activities require?
4. Explain the type of training you received in management of money.

Shelter:

1. How was your house heated? What kind of fuel was used? How long did it take to heat the house from the time the heating unit was activated to the time the house was warm? Did you close off parts of the house to keep other parts warmer?
2. How did you keep yourself warm in the winter. What kinds of blankets did you have on your bed? How were they made?
3. How was the air circulated throughout your home?
4. How did you cool your home in the summer?
5. How was water heated for bathing and laundry?
6. What type of lighting did you use in your home?

Transportation:

1. What methods of travel were available to you during your childhood? How did you get to school, the store or church?
2. What was the make (Chevrolet, Ford, etc.) of your family's first car? How much did it cost?
3. What were roads like when you were a young child?
4. We transport many products by truck today. How were they transported when you were a child?
5. What types of fuel were used to operate transportation vehicles.

6. Describe the types of trips you took as a child. How far away from your home did you travel?
7. What kinds of sidewalks, roads, bridges, etc. were being used during your childhood?
8. How close did you live to neighbors? To stores? To schools? To churches? To hospitals?
9. What place did you visit most often in your childhood?
10. In what ways did the invention of and/or use of the car change your town or city?

Conclusion:

1. In what ways is life more enjoyable for you now that we have electricity, plastics, detergents, and other oil and natural gas products?
2. In what ways did you like the "good old days" better?
3. Do you think that we will be able to take care of energy problems in the future as we have in the past? Do you foresee a need to change back to a more simple lifestyle than we have now? Do you think people today will be able to adapt to the changes as they did years ago?

Packaging

1. Introduce packaging by talking about the history of packaging using the poster and the following information:

   A. Early peoples used things that were available to them such as hides, woven twigs, layers of bark and large leaves to carry foods short distances. But these provided little protection.

   B. Since greater protection was needed wooden boxes, barrels, baskets and earthenware jars evolved. What are some of the weaknesses of these kinds of packaging?

   C. In the 1700's, as urban markets grew, paperboard boxes and fiber containers were developed for greater protection of products during transport and storage. However, foods were still subject to contamination by rodents, insects, molds and bacteria.

   D. In the 1800's, the process of canning revolutionized the food industry. Air tight containers--thick glass jars or hand-soldered tin cans--were used. The process of heat sterilization destroyed common food spoilage bacteria. This method of food preservation didn't drastically alter the product's nutrient value, flavor or appearance.

2. Read the display--"Each package must be designed to perform a variety of functions...". Read each function and discuss it.

   A. In the history of packaging which of these functions were handled?

   B. Which were not?

   C. Which do you consider to be the most important functions? Why? Least important functions? Why?

3. Talk about magnetic board display: Explain how fossil fuels are used in making and transporting the different packages.

   A. Three Biggest Energy Users are:

	Manufacturing	Heating and Cooling	Transportation
Use of fossil fuels	ratural gas oil coal	natural gas oil coal	oil

4. Discuss what materials the different packages are made of. Use as many of the following as you can:

plastics	steel
styrofoam	glass
saran	cardboard
aluminum	paper
tin	cellophane

   A. Make sure that the students know what the different materials are.

   B. Put three categories on the board:
   WOOD ELEMENTS OIL
   and have the students put the names of the materials under the correct category.

   C. Examples of such groupings are:

WOOD	ELEMENTS	OIL
paper	glass	plastics
cellophane	tin	saran
	aluminum	styrofoam
	steel	

   D. Make sure that the students are aware of which materials are made from fossil fuels.

5. Ask the students to think about which of the packaging items would be the most energy efficient to buy:

   A. a styrofoam egg carton or a cardboard egg carton

B. fruits and vegetables packaged in paper sacks or plastic bags /

C. a plastic liter bottle or glass bottles

D. Your own examples:

The students should make their decisions according to the information you talked about in #3 and #4.

6. Bring out information about recycling.

A. Glass can be recycled and reused (sterilized).

B. Aluminum and steel can be recycled.

C. Plastics cannot be recycled or reused as easily as the others. But students can come up with ideas about how they could use the items for other things. Examples: storing things at home, toys

7. As future consumers, students can learn how they might go about exercising their rights by telling store owners that they would be interested in seeing them buy items packaged differently. Example: Paper vs. plastic. They might consider returning paper sacks to grocery stores to be used again.

8. Students can also look for examples of over-packaging.

9. <u>STRESS</u> that we are not telling students what to do, but to be aware the options they face in making energy decisions.

Manufacturing Uses Energy

Manufacturing is one of the big energy users. Information on the energy needed to produce goods can create an awareness for possibilities to re-use and re-cycle products.

Energy Expenditure in Manufacture of Various Materials (M Calories per ton)

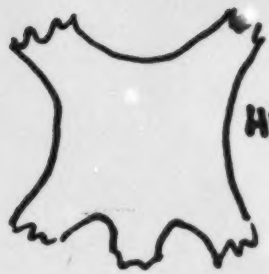
Material	Energy
Metals	
Steel	6.5
Aluminum	18.8
Lead	7.8
Copper	10.0
Zinc	11.5-13
Cement, Clay, Glass	
Cement	2.5
Glass	
Plate & Bottles	3.5-4.5
Technical Glassware	13.5
Handmade Glassware	20.0
Porcelain & China	10.0
Tile	1.
Bricks	.25-1.5
Plastics	
Polyethylene	34.
Polypropylene	36.
Polyvinylchloride	26.
Polystyrene	11.

Source: Patterns of Energy Consumption in the United States, Office of Science and Technology, Executive Office of the President, Washington, D.C., 1972.

Suggestions:

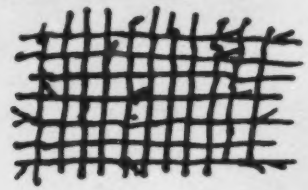
1. Research available materials.
2. Students can write for information.
3. Display students' illustrations of the various phases in the manufacturing process.
4. Students can bring articles made from the materials for display and investigation.
5. List ways to use this knowledge in buying things to help save energy.

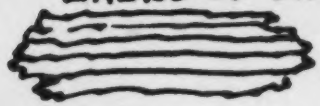
HISTORY OF PACKAGI..



HIDES

WOVEN TWIGS



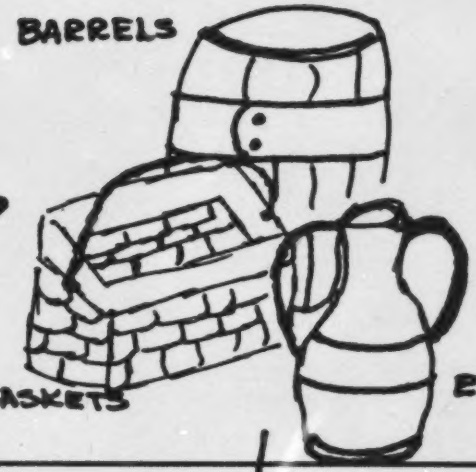


LAYERS OF BARK

LARGE LEAVES

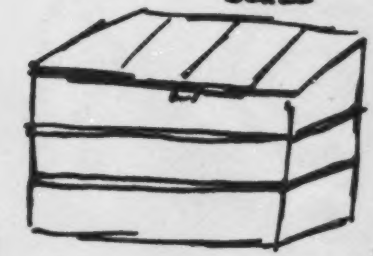
EARLY FORMS

BARRELS



BASKETS

WOODEN BOXES



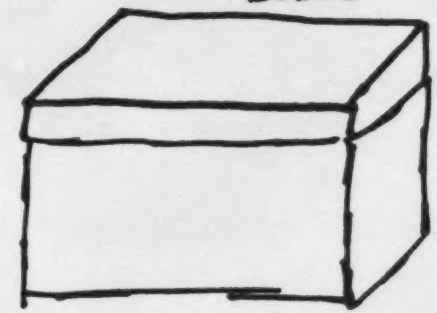
EARTHENWARE JARS

MASON (GLASS) JARS

TIN CAN

1800's

PAPERBOARD BOXES



BURLAP - FIBER CONTAINER

1700's

FUNCTIONS OF A PACKAGE

Each package must be designed to perform a variety of functions.

1. To contain the product in amounts conveniently sized and shaped for consumer needs.
2. To protect the product from contamination, spoilage, crushing and breakage.
3. To preserve the nutritive value and quality of the product.
4. To facilitate product storage and preparation.
5. To convey important information about the product.

• 3 Biggest Users of ENERGY

Source: Energy and Science: Investigations in Process Making, Biological Sciences Curriculum Study, 1977, pp. 61, 63, 66, 67

Packaging

ADDITIONAL INFORMATION

1. Each of us was responsible for 1400 pounds of solid waste in 1979. That amount of trash would fill three garbage trucks (side by side) from New York to California.
2. It cost $6,000,000,000 to collect and dispose of all our trash in 1979.
3. Of all the trash we accumulate, a little more than 1/3 of it is from packaging--bags, bottles, boxes, cans and other containers.

ADDITIONAL IDEAS

McDonalds

Go to McDonald's to find out:

- How many wrappers, paper bags, plastic boxes, etc., they use daily
- Approximate cost of these throw-aways
- Cost of trash hauling
- Number of trees required to make McDonald's throw-away for one day (optional)

At Supermarket

Visit supermarket to:

- List as many throw-away packages as possible
- Check with meat counter "boss" how much wrapping is needed for meat

In School

- Check with custodian how much paper toweling is used daily
- Collect aluminum or styrofoam lunch trays (rinse in a bucket right after lunch)
- Count number of straws used in a day, a week
- Collect "fancy packages" (colorful, inside moldings, unusual shapes, etc.), list forms of energy used
- Collect throw-aways for one week at home
- Bring to school and make a "throw-away" tree

Wichita Eagle

- Visit to see use of energy to run presses
- Number of trees cut daily to supply paper

RESOURCES USED IN PACKAGING

MANUFACTURING	HEATING AND COOLING
1.	1.
2.	2.
3.	3.

TRANSPORTATION

1.

MATERIALS	SOURCES	
Saran	OIL	1.
tin		3.
styrofoam		3.
cellophane		
steel	WOOD	1.
glass		2.
plastic		
aluminum	ELEMENT	1.
paper		2.
		3.
		4.

NAME: _____ DATE: _____

Insulation Display

Instructions:

The insulation display is designed to teach the students about various kinds of insulation, good and poor features of windows, and several other aspects of home insulation. This is accomplished through samples of several kinds of insulation (fiberglass, cellulose, etc.), actual window models, and a "hand-on" demonstration of stapling in batts of insulation and chaulking bad seams and cracks in a model wall section.

Notes:

Which of the following questions could be answered with this activity?

1. What is energy doing?

2. What forms are being converted?

3. What resources are being used?

4. What changes could this activity mean for society?

5. How could this activity change the individual's use of energy?

Insulation

Introduction:

- Review three major energy use areas (transportation, manufacturing, and heating - cooling).
- Kids can't do much in manufacturing. Name several things for transportation (walking, car pooling, mass transportation, stay at home).
- Kids can do things in heating and cooling.
- Seven things they can do. (Appoint seven to be especially responsible for each.)

1. Wear several layers of clothes.
   a. Two sweaters are worth 5° lower setting.
2. Close the door.
   a. Illustrate - with open school doors in winter.
   b. Illustrate - open doors at K-Mart, etc.
3. Check door weather stripping.
   a. Most people don't know they have a hole in their house. A crack, as thick as a quarter, around a door is equal to about 15 square inches. (Proceed to show several types of weather stripping.)
   b. Use mini-doors to show various types of weather stripping.
   c. More doors mean a larger hole in their house.
   d. Usually largest crack is under front door. (Some kids put rugs or rags to keep out cold.)
4. Install gaskets.
   a. Check draft coming from switches and receptacles. (Show receptacle and switch plate gaskets.)
   b. Be sure to install on outside walls first, walls that have the windows. That is where most cold air comes in.
   c. Illustrate use of foam gaskets.
   d. Go over safety sheet procedure carefully using display.
5. Take short showers.
   a. Illustrate how to install water saver in shower head.
   b. Long showers and tub baths use lots of hot water--energy wasters.

6. Ask parents about home insulation.

   a. Explain "R" value (3½" = R-11 6" = R-19 fiberglass). Most cellulose is higher in R value than fiberglass (about 3.8 per inch vs 3.2 in fiberglass). Rock wool is about the same as cellulose: it's made from slag left over from iron ore.

   b. Insulation for Wichita should be 19-18-38--19 in floors, 18 in walls, and 38 in ceilings.

7. Caulk outside of house.

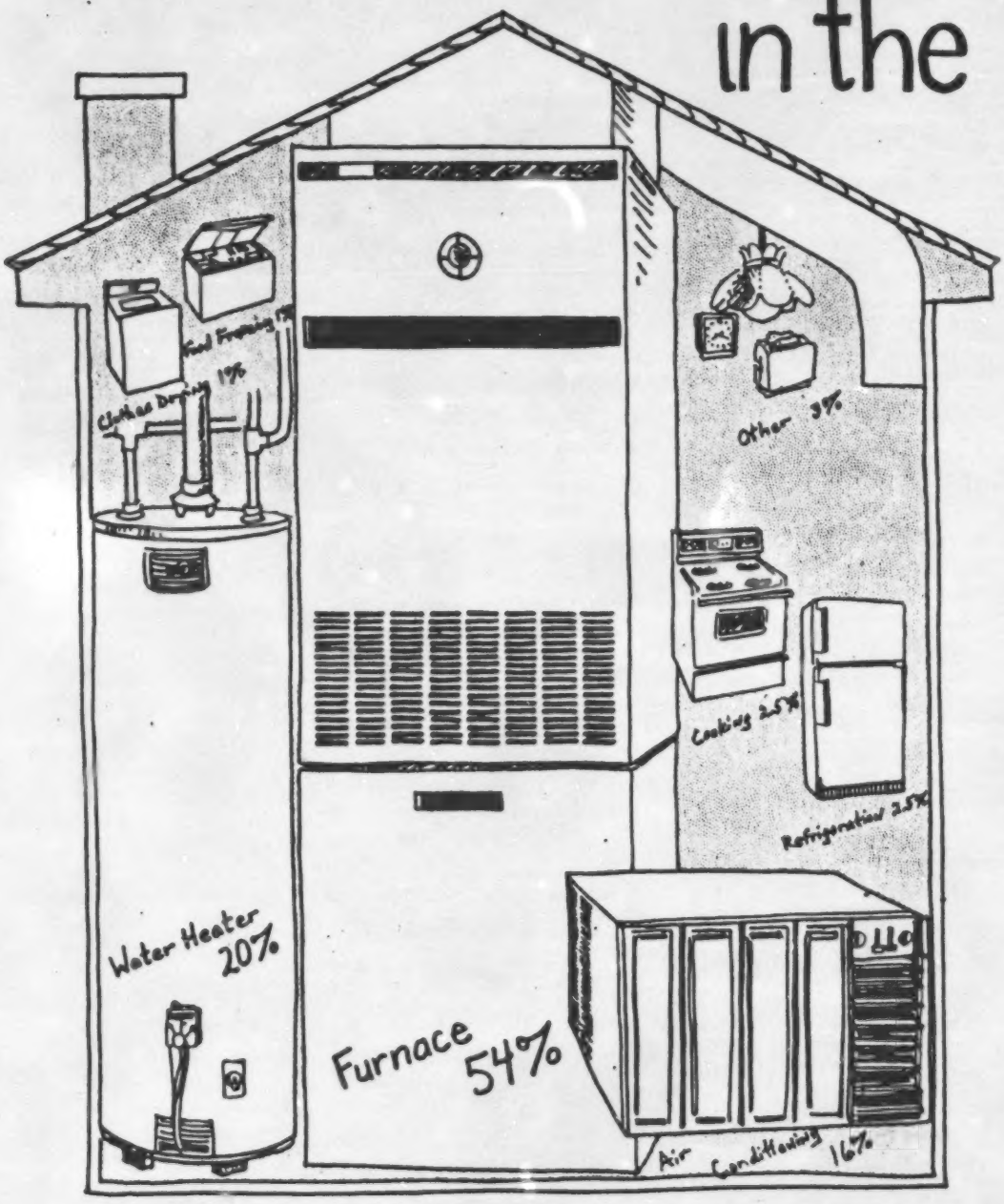
   a. Review energy savers #1-6. Caulking is like zipping up a jacket, final touch to keep out weather.

   b. Kids can check home and remind parents to do some caulking.

   c. Let students caulk about one board each.

. Review all seven things they can do.

ENERGY Users in the



HOME

Source: Energy and Society: Investigations in Decision Making, Biological Sciences Curriculum Study, 1977, p. 62, and

Final Reports of Task Force Groups, Exhibit, Energy Commission, November 15, 1979, p. 9

EASY WAYS TO SAVE ENERGY IN YOUR HOME

Weatherstrip any outside doors.

Caulk around windows, door frames, and cracks.

Install storm windows and doors.

Transform balcony into a greenhouse.

Clean heater outlets and return air inlets often.

Open shades and curtains to let in the warmth of the winter sun; close them when the sun goes down or doesn't shine.

Set your furnace thermostat as low as possible for your comfort, then leave it alone for everyday use. When no one is home during the day, or if occupants work, turn the thermostat back at least to 55°F (the same is true if you take a winter vacation or leave for a weekend.

Reduce heat at night by turning down the thermostat about 8° or so.

Keep heat outlets free of furniture and other obstructions. Place furniture used for sitting away from cold windows or chilly outside walls.

Cooling systems should be checked and serviced at the beginning of each cooling season. Clean filters and fans and set motors properly.

Set summer thermostat no higher than 78°. Keep all doors and windows closed.

Use natural cooling as much as possible. Keep windows open in the early morning and evening hours.

Make optimum use of drapes and pull-down shades, they can reduce heat gain through windows by as much as 50% by keeping hot sunlight out.

If you use electric furnace heating, consider a heat pump system.

Heating and cooling can consume 50-70% of all energy used in the home.

When you are not using your fireplace, keep damper and glass doors closed.

Make sure your furnace is not oversized.

Summertime temperature in an attic can soar up to 180° or more. Attic vents are essential to reduce the heat coming down in the living space.

Close off unoccupied rooms.

Don't turn the heat on until you have to. Instead wear heavier clothing and use an extra blanket.

Dust or vacuum radiator surfaces frequently.

Turn off the furnace pilot light in the summer.

Consider the advantages of a clock thermostat for your heating system.

Don't use your fireplace for supplemental heating when your furnace is on.

If you have oil heat, check to see if the firing rate is correct.

Don't let cold air seep into your home through the attic access door.

Use lights only when you need them. Light the place of task, not complete room or house. Buy lower wattage bulbs. Remember: Wattage rating only tells you how much electricity it takes to make the bulb work. Brightness is measured in lumens - so compare lumens and buy the maximum light for your dollar. Long life bulbs may not be the best buy because they use more energy for light given off.

Consider using fluorescent lights whenever you can; they give out 4 times more lumens per watt.

Clean and replace filters on furnaces, rangehoods and exhaust fans.

Remember: Close the door!
Turn out the light!
Do not turn on the shower full blast!
When no one is using them, turn off the TV and stereo (if you have one)!

Insulation should be checked or added to obtain the proper R factor. R factor of 19 for walls and floors in Wichita and R factor of 30 for attic in Wichita.

Use kitchen, bath and other ventilating fans sparingly.

Be sure to check on Federal Income Tax breaks available for investing in certain home energy conservation measures. These measures include insulation, storm windows and doors, caulking and weatherstripping, modifying existing furnaces to improve efficiency, and the use of clock thermostats.

Homeowners and business people who buy solar hot water heaters, space heating and cooling equipment, wind energy, or geothermal energy systems are entitled to a tax credit.

Reduce your use of hot water. Take short showers rather than baths. Install showerhead flow restrictors, use warm or cold water as much as possible for washing/rinsing clothes and dishes.

The hot water system in your home can be a major energy-waster. You can wrap the heater and exposed hot water lines with insulation, lower the heater thermostat setting, have the heater serviced by a qualified person, repair all leaky faucets as quickly as possible.

Most water heaters are set for 140°F or higher. A setting of 120°F can provide adequate hot water for most families. Reducing from 140° to 120° could save over 18% of the energy you use at the higher setting.

Don't let sediment build up in the bottom of your hot water heater, it lowers the heater's efficiency and wastes energy.

Traffic Count

Instructions:

Two participants go to a heavily travelled street. One person calls out the number of occupants in each vehicle that passes by while the other person records the numbers on a clipboard. Note the time of day, location of street, and type of vehicle.

After you have this information, you can:

1. Find the average number of occupants in each vehicle.
2. Obtain EPA statistics.
3. Compare passenger miles per gallon of gas.

Some questions that might be asked of the students are:

1. What does this information suggest?
2. How can this situation be improved?
3. What other suggestions do you have?

Notes:

Which of the following questions could be answered with this activity?

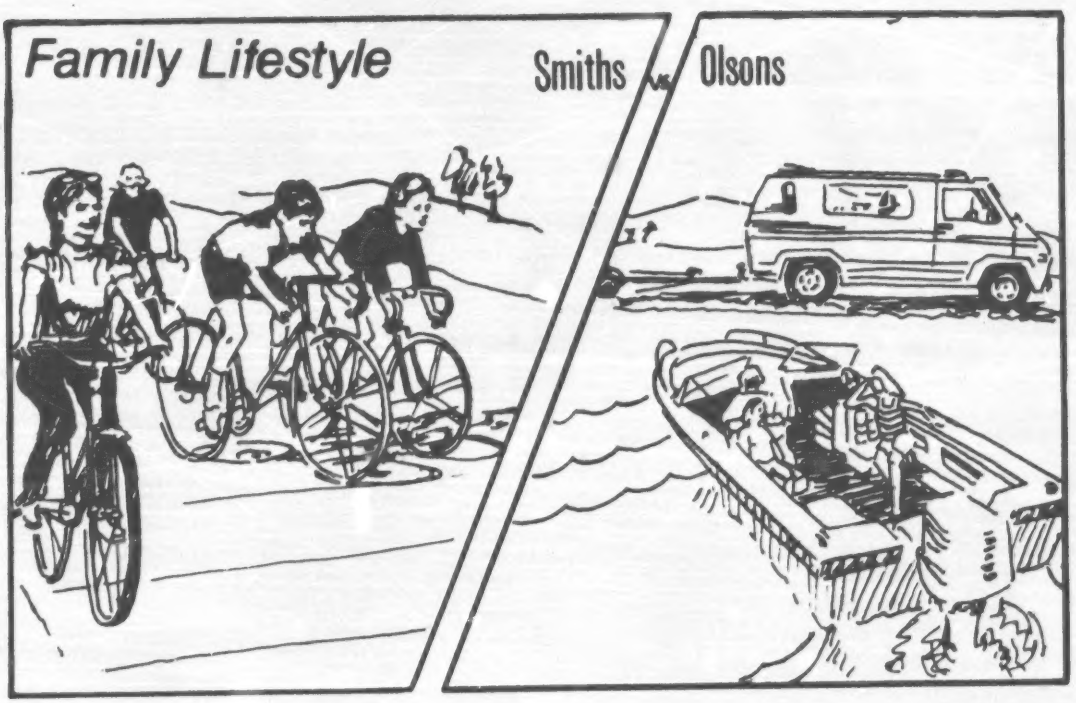
1. What is energy doing?

2. What forms are being converted?

3. What resources are being used?

4. What changes could this activity mean for society?

5. How could this activity change the individual's use of energy?



Instructions:

We would like you to meet two families--the Olsons and the Smiths. Pretend they have invited you to visit their homes in order to become acquainted with them. After reading the brief description of the two families, write a paper telling how these lifestyles vary according to their commitment to the energy problem. Later, role play the two families.

The Smiths

The Smiths have realized there is an energy problem for quite sometime. They have made several changes in their lifestyle and home environment because of the growing energy problem. According to the Smiths, the problem is everyone's responsibility and conservation must be practiced by all.

The Olsons

The Olsons believe there really isn't an energy problem. There just isn't much they can do. The problem is the big oil

(continued)

companies. The Olsons earn enough money to pay their utility bills and are optimistic that the government will develop alternatives before the energy situation becomes a problem.

Points you may wish to consider:

- Home location and site
- Climate
- Home heating and cooling
- Recreation and leisure time
- Purchasing habits--manufacturing
- Transportation
- Careers

Notes:

Which of the following questions could be answered with this activity?

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